

**DIGITAL REVERSE TRANSMISSION FREQUENCY TRAINING METHOD
FOR TIME DIVISION DUPLEX (TDD) COMMUNICATION SYSTEM**

ABSTRACT OF THE DISCLOSURE

A Time Division Duplex (TDD), Code Division Multiple Access (CDMA) communication system includes a plurality of Customer Premises Equipment (CPE) and an Access Point (AP) that communicate through RF links. A CPE contains a receiver baseband subsystem and a transmitter baseband subsystem, and further contains receiver circuitry operable during a receive period for receiving an RF carrier from the AP and for deriving a receiver tracking signal that is indicative of a frequency and phase shift between the received RF carrier and a reference signal. The receiver circuitry further includes a frequency to phase accumulator (FPA) and a digital phase shifter (DPS) for correcting the frequency and phase of a receiver baseband signal by an amount and in a direction indicated by the receiver tracking signal. The CPE further contains multiplexing circuitry for sharing the FPA and DPS circuitry between the receiver baseband subsystem and the transmitter baseband subsystem. Also contained in the CPE is transmitter circuitry operable during a next transmission period for operating the FPA and DPS circuitry to correct the frequency of a transmitter baseband signal by an amount indicated by the receiver tracking signal, and in a direction opposite to the direction indicated by the receiver tracking signal. The effect is pre-compensate an RF carrier that is transmitted to the AP from the CPE so as to reduce carrier acquisition time at a receiver of the AP. The CPE further contains sample and hold circuitry that is responsive to an end of the receive period for storing the receiver tracking signal for use by the FPA and DPS circuitry during the next transmission period.

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